Volunteer Lake Assessment Program Individual Lake Reports

ISLAND POND, DERRY, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	10,880	**Max. Depth (m):**	24.3	**Flushing Rate (yr^{1})**	1.8
Surface Area (Ac.):	498	**Mean Depth (m):**	5.4	**P Retention Coef:**	0.55
Shore Length (m):	14,600	**Volume (m^{3}):**	11,558,000	**Elevation (ft):**	205

TROPHIC CLASSIFICATION

Year	Trophic class
1985	MESOTROPHIC
2002	EUTROPHIC

KNOWN EXOTIC SPECIES

Fanwort
Variable Milfoil

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

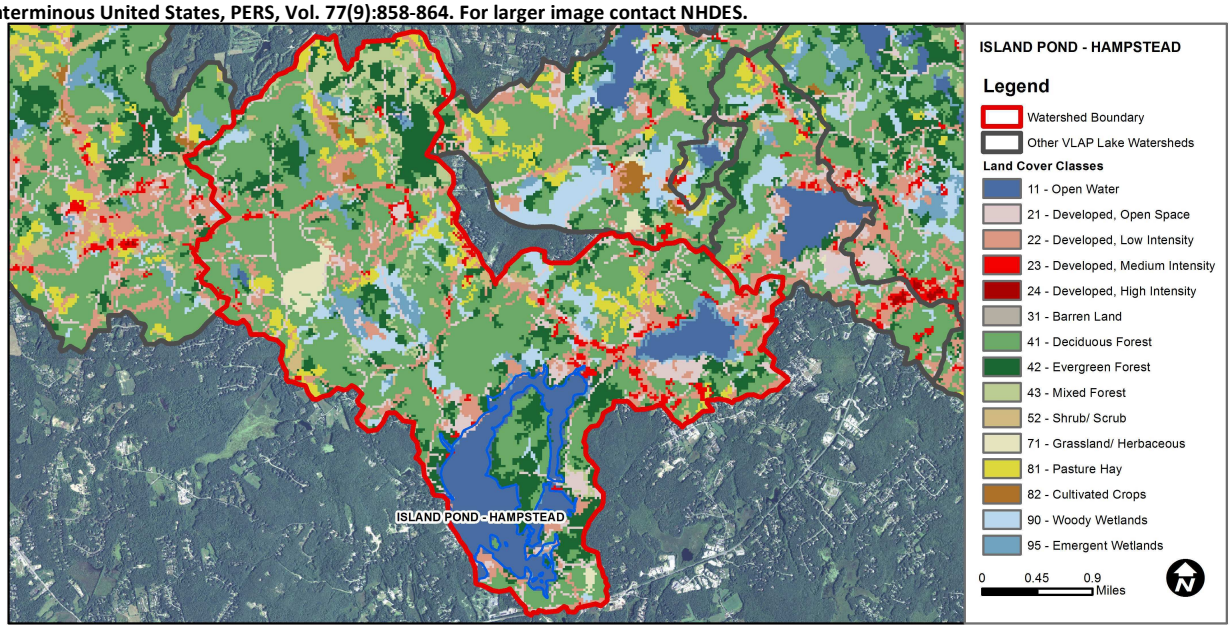
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	>/=5 samples and median is >threshold.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	D.O. (% sat)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	Chlorophyll-a	Slightly Bad	>5 samples and median is > threshold.
Primary Contact Recreation	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).
	Chlorophyll-a	Very Good	At least 10 samples with 0 exceedances of criteria.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

ISLAND POND - SANBORN SHORE ACRES	E. coli	Cautionary	One exceedance of single sample criteria but not enough data to calcuate geometric mean. More data needed.
ISLAND POND - CHASE'S GROVE	E. coli	Bad	>/=1 exceedance(s) of geometric mean criterion and/or >/=2 exceedances of single sample criterion, with 1 or more >2X criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.

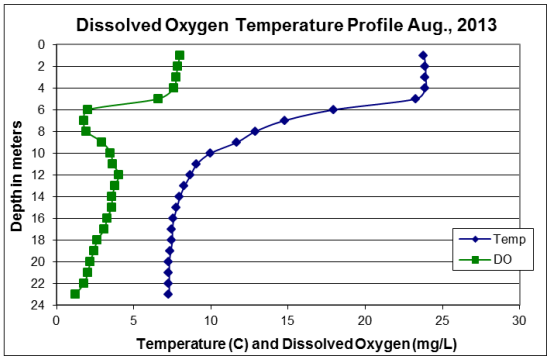


Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	10.8	Barren Land	0	Grassland/Herbaceous	1.33
Developed-Open Space	7.27	Deciduous Forest	38.67	Pasture Hay	3.98
Developed-Low Intensity	10.4	Evergreen Forest	12.87	Cultivated Crops	0.25
Developed-Medium Intensity	2.02	Mixed Forest	3.73	Woody Wetlands	4.52
Developed-High Intensity	0	Shrub-Scrub	1	Emergent Wetlands	3.08

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
BIG ISLAND POND, DERRY, NH
2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **CHLOROPHYLL-A:** Chlorophyll levels were slightly elevated in June and August, and average levels were greater than those measured in the last five years potentially due to above average precipitation and associated stormwater runoff. Historical trend analysis indicates significantly increasing (worsening) chlorophyll since monitoring began.
- **CONDUCTIVITY/CHLORIDE:** Spring chloride sampling indicated slightly elevated chloride in Culvert #1, #3, Drew Inlet and Taylor Brook Upstream. Hemlock Heights Beach chloride levels were elevated and greater than the chronic chloride standard. Deep spot and tributary conductivity and chloride levels were elevated on each sampling event and much greater than the state medians. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity since monitoring began.
- **E. COLI:** E. coli levels in Campground Inlet and Drew Inlet were slightly elevated but not greater than the state standard for surface waters on the June sampling event following significant storm event. This is not unusual following a large volume of rainfall as stormwater runoff can transport contributions from domestic animals and wildlife. E. coli levels on all other sampling events were much less than state standards for surface waters.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus was elevated in August and 2013 average was greater than the past two years. Historical trend analysis indicates highly variable epilimnetic phosphorus between years. Metalimnetic and hypolimnetic phosphorus levels remained relatively low on each sampling event. Campground Inlet phosphorus levels were slightly elevated in June and July but were within an average range for this station. Drew Inlet phosphorus levels were slightly elevated in July potentially due to low flow conditions, however average phosphorus levels were the lowest measured since 2005. Taylor Brook phosphorus was stable and average on each sampling event.
- **TRANSPARENCY:** Transparency was low in June and August due to the elevated algal growth, but improved in July when algal growth was lower. Viewscope transparency was consistently better than non-viewscope transparency and likely a better measure of water clarity. Historical trend analysis indicates significantly decreasing (worsening) transparency since monitoring began.
- **TURBIDITY:** Turbidity levels were low to average at all stations on each sampling event. This is good news considering the significant storm event prior to sampling in June.
- **PH:** pH tends to decrease to critical levels in the Metalimnion and Hypolimnion. Historical trend analysis indicates relatively stable epilimnetic pH with moderate variability between years.
- **RECOMMENDED ACTIONS:** The elevated chloride and increasing epilimnetic conductivity trend indicate the need to implement low salt zones around the lake and/or educate local road agents and homeowners on the proper use of winter de-icing materials. Encourage local road agents to obtain a NH Voluntary Salt Applicator license through the UNH Technology Transfer Center's Green SnowPro Certification Program. The worsening chlorophyll and transparency trends go hand in hand. As chlorophyll levels (algal growth) increase, transparency (water clarity) typically decreases. Phosphorus is the nutrient promoting algal growth. Educate lake and watershed residents on ways to reduce phosphorus contributions from their properties, particularly through managing stormwater runoff, reducing fertilizer use, and using phosphate free fertilizers. DES' "Homeowner's Guide to Stormwater Management" is an excellent resource.



NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

Table 1. 2013 Average Water Quality Data for ISLAND POND

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m NVS	Trans. m VS	Turb. ntu	pH
Campground Inlet			37	196.5	57	20			0.87	7.03
Culvert #1			36							
Culvert #3			55							
Drew Inlet			29	153.9	77	19			0.78	6.69
Epilimnion	12.43	6.93	31	165.1		12	3.04	3.75	0.63	7.13
Metalimnion				167.6		8			0.64	6.47
Hypolimnion				166.7		9			1.36	6.44
Hemlock Heights Beach			240		10					
Taylor Brook			29	167.7	27	17			0.77	6.81
Taylor Brook Upstream			35							
Chases Grove Beach					90					

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	Stable	Trend not significant; data moderately variable.	Chlorophyll-a	Degrading	Data significantly increasing.
Conductivity	Degrading	Data significantly increasing.	Transparency	Degrading	Data significantly decreasing.
			Phosphorus (epilimnion)	Stable	Trend not significant; data highly variable.